

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

REC'D 08 JUL 2005

PCT

To:

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/B2005/051108

International filing date (day/month/year)
04.04.2005

Priority date (day/month/year)
08.04.2004

International Patent Classification (IPC) or both national classification and IPC
H04N7/34, H04N7/50, H04N5/14, G06T7/40, G06F17/30, G11B27/28

Applicant
KONINKLIJKE PHILIPS ELECTRONICS N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2005/051108

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2005/051108

Box No. V Reasoned statement under Rule 43b/s.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-4
	No: Claims	5
Inventive step (IS)	Yes: Claims	
	No: Claims	1-5
Industrial applicability (IA)	Yes: Claims	1-5
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V.

1 Reference is made to the following documents:

- D1 : WO 03/061280 A (KONINKLIJKE PHILIPS ELECTRONICS N.V) 24 July 2003 (2003-07-24)
- D2 : WO 02/093929 A (KONINKLIJKE PHILIPS ELECTRONICS N.V) 21 November 2002 (2002-11-21)
- D3 : "ISO/IEC CD 13818-: INFORMATION TECHNOLOGY - GENERIC CODING OF MOVING PICTURES AND ASSOCIATED AUDIO INFORMATION PART 2: VIDEO" INTERNATIONAL STANDARD - ISO, ZUERICH, CH, no. 659, 1 December 1993 (1993-12-01), pages A-C,I,59-60,128, XP002333259
- D4: FERNANDO W A C ET AL: "SCENE CHANGE DETECTION ALGORITHMS FOR CONTENT-BASED VIDEO INDEXING AND RETRIEVAL" ELECTRONICS AND COMMUNICATION ENGINEERING JOURNAL, INSTITUTION OF ELECTRICAL ENGINEERS, LONDON, GB, vol. 13, no. 3, June 2001 (2001-06), pages 117-128, XP001058771 ISSN: 0954-0695
- D5: KOPRINSKA I ET AL: "Temporal video segmentation: A survey" SIGNAL PROCESSING. IMAGE COMMUNICATION, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 16, no. 5, January 2001 (2001-01), pages 477-500, XP004224651 ISSN: 0923-5965

2 INDEPENDENT CLAIM 1

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 1 does not involve an inventive step in the sense of Article 33(3)PCT.

Document D1, which is considered to represent the most relevant state of the art to the subject matter of claim 1, discloses (the references in parentheses applying to this document):

A coding method for coding digital video data available in the form of a video stream

comprising consecutive frames divided into macroblocks themselves subdivided into contiguous blocks, said frames being coded in the form of at least I-frames, independently coded according to a coding mode said intra, P-frames, temporally disposed between said I-frames and predicted from at least a previous I- or P-frame, and B-frames, temporally disposed between an I-frame and a P-frame, or between two P-frames, and bidirectionally predicted from at least these two frames between which they are disposed,

(D1: figure 2, implicit features of "MPEG 2 encoder")

said coding method comprising the following steps:

- a structuring step, provided for capturing, for all the successive macroblocks of the current frame, related coding parameters characterizing the fact that they have been coded, or not, according to a predetermined mode;

(D1: page 7, lines 7-17)

- a computing step, for delivering, for said current frame, statistics related to said parameters;

(D1: page 7, lines 17-29)

- a detecting step, provided for detecting, the occurrence of an image, or of a sub-region of an image, which is either monochrome or with a repetitive pattern;

(D1: page 6, lines 21-32; page 7, line 20 - page 8, line 18; page 1, lines 13-17, and fig. 4 "separator detected")

- a description step, provided for generating description data of said occurrences of images or sub-images either monochrome or with a repetitive pattern;

(D1: page 8, last line - page 9, line 4)

- a coding step, provided for encoding the description data thus obtained and the original digital video data.

(D1: page 3, lines 3-17)

2.2 The subject-matter of claim 1 differs from the disclosure of D1 in that:

- said coding parameters characterizing the fact that they have been coded, or not, according to a predetermined intra prediction mode;
- an analysing step, provided for analysing said statistics and for determining the number of blocks of said current frame which exhibit, or not, said intra prediction mode;

- detecting either monochrome or a repetitive pattern each time said number is greater than a given threshold.

2.3 The problem to be solved by the present invention may therefore be regarded as

How to speed up the detection process of monochrome or a repetitive pattern frames.

2.4 In view of D3 the solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

In D1 monochrome frames are detected by evaluating the sum of absolute differences of DC values of neighboring blocks. The DC values are received by MPEG-2 encoding (*D1: page 7, lines 7-24*). According to the MPEG-2 Standard (*D3: page 59, line 10 - page 60, line 22*) the DC value in intra macroblocks is encoded by spatial intra prediction, since the DC value is predicted from an already encoded DC value of a spatially neighboring block. In order to detect a monochrome frame the sum of absolute differences of DC values must be zero in the ideal case or at least very low for non ideal monochrome frames.

Thus, the remaining problem for the skilled person is: how to speed up the detection of low difference DC values from an MPEG-2 encoded bitstream.

According to the standard zero and low DC difference values can be directly retrieved from the intra DC spatial prediction coding mode variable "dc_dct_size", which specifies the number of bits used to encode the DC difference value

"dc_dct_differential" (*D3: page 59, lines 11-15 and page 128, tables B-12 and B-13*).

For example, the intra prediction mode "dc_dct_size = 0" specifies the case in which two neighboring DC values are identical, i.e. "dct_diff=0" (*D3: page 60, lines 8-10*).

Since the skilled person can retrieve zero or low DC difference values directly from the intra prediction mode "dc_dct_size" (being 0 or low) without the need for completely decoding the DC values followed by computing the DC difference values again, he would do so in order to speed up the detection process.

The simplest way to evaluate the intra prediction modes in a frame in order to detect an ideal monochrome frame is to count the number of "dc_dct_size=0" block modes

and to compare it with a threshold. The skilled person would perform counting and thresholding to detect the frame type without employing inventive skills, since this is a well known method in the field of frame detection from MPEG compressed bitstreams. It is, for example, used for detection of scene changes in D4 (page 121), D5 (page 491, equation 23) and as well in the MPEG-7 standard part 8 (TEXT OF ISO/IEC 15938-8 PDTR EXTRACTION AND USE OF MPEG-7 DESCRIPTIONS, Document N4360, July 2001, pages 113-114).

- 2.5 Therefore the features disclosed in D1 and D3 would be combined by the skilled person, without exercise of any inventive skills in order to solve the problem posed. The proposed solution in independent claim 1 thus cannot be considered inventive (Article 33(3) PCT).

3 INDEPENDENT CLAIM 2

The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 2 does not involve an inventive step in the sense of Article 33(3)PCT.

Since claim 2 is the corresponding apparatus claim to the independent method claim 1 and since D1 and D3 disclose not only the method but also the corresponding apparatus independent apparatus claim 2 does not involve an inventive step for the same reasons given in section 2 in this WOISA.

4 INDEPENDENT CLAIM 3

Due to the clarity problems mentioned below under Re item VIII for the examination of novelty and inventive step claim 3 is considered to be an apparatus claim having the same features as claim 2. Thus, for the same reasons as given above for claim 2 the subject matter of claim 3 does not involve an inventive step in the sense of Article 33(3)PCT.

5 INDEPENDENT CLAIM 4

The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 4 does not involve an inventive step in the sense of Article 33(3)PCT.

Since claim 4 is the corresponding computer program claim to the independent apparatus claim 3, it is to be observed that each code section of the program is perfectly matching to one corresponding technical feature of the apparatus claim. Since a skilled person knows how to build the code of the program and since the apparatus is not inventive, the generation of the program of claim 4 does not involve an inventive step.

6 INDEPENDENT CLAIM 5

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 5 is not new in the sense of Article 33(2) PCT.

In claim 5 a transmittable coded signal is claimed which has been coded according to the method of claim 1. Thus, the signal comprises "encoded description data" (of monochrome frames) and "encoded digital video".

Since D1 discloses the same signal with the same two features as given above (*D1: page 3 lines 14-15*), although not produced by the same method, the signal of claim 5 is not novel over the signal of D1.

7 INDEPENDENT CLAIMS 1-4

Independent claims 1-4 are novel over the prior art (Article 33(2) PCT).

8 INDEPENDENT CLAIM 5

The subject-matter of independent claim 5 is also not inventive (Article 33(3) PCT).

9 INDEPENDENT CLAIMS 1-5

Independent claims 1-5 disclose methods and apparatus for video coding and indexing applications. Therefore, the subject-matter of these claims is considered to be industrially applicable according to Article 33 (4) PCT.

Re Item VIII.

Claim 3 does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined.

As explained below, some of the features in the apparatus claim 3 relate to a method of using the apparatus rather than clearly defining the apparatus in terms of its technical features. The intended limitations are therefore not clear from this claim, contrary to the requirements of Article 6 PCT.

"For use in an encoding device for coding ... said encoding device comprising:
... means..."

What is for use in the encoding device?

To enable the examination of inventive step and novelty the claim is interpreted as "An encoding device ...", i.e. the first three words of the claim are neglected.